Electronic Supplementary Material (ESI) for Analyst
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Supporting Information

An elastography analytical method for the rapid detection of endotoxin

Haixuan Sun,[abc] Peng Miao,[*ac] Yuguo Tang,[*ac] Bidou Wang,[a] Jun Qian[a] and Danyi Wang[a]

[a] *CAS Key Lab of Bio-Medical Diagnostics, Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, Suzhou, China.*

[b] *Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Science, Changchun, China.*

[c] *University of Chinese Academy of Sciences, Beijing, China*

* Corresponding authors. E-mail: miaopeng@sibet.ac.cn and tangyg@sibet.ac.cn.

EXPERIMENTAL SECTION

Materials and Chemicals. Potassium ferricyanide were purchased from Sigma (USA). Standard endotoxin and LAL reagent were purchased from Chinese Horseshoe Crab Reagent Manufactory Co., Ltd. (Xiamen, China). Physiological saline (PS) was purchased from local clinic. HeLa cells were provided by the Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences. DMEM was from Gibco (Gaithersburg, USA). All other chemicals were of analytical grade. Endotoxin-free pipet tips and water were used for all endotoxin assays. Other solutions was prepared with water that was purified with a Milli-Q purification system (Branstead, USA) to a specific resistance of >18 MΩ cm.

EG Analytical Platform Setup. The EG analytical platform was built by the combination of printed circuit board, cam driving mechanism, thermostatic bath and elasticity detecting unit. Printed circuit board controlled the circling of cam motor at a constant speed and maintained the temperature of the thermostatic bath (37 °C). The energy was supplied by an Agilent direct current power supply (E3631A) at the voltage of 24 V.

EG Analysis of Endotoxin-Induced LAL Coagulation. Standard endotoxin solutions with the concentration of 0, 0.01, 0.05, 0.2, 0.5, 1.0, 2.0, 10.0, 20.0 EU mL^{-1} were firstly prepared. LAL reagents were mixed with standard endotoxin solutions or samples that contain different amount of endotoxin with the ratio of 1 : 3. The mixture was then placed in the test tube for the following EG recording and analysis.

Endotoxin Assay in Real Samples. Pharmaceuticals may be contaminated in the production chain by endotoxin released from bacteria, which may cause hazard to human health. We employed PS and cell culture medium as real samples to test the practical performance of the proposed EG analytical method. The samples were then spiked with different amount of endotoxin before the EG analysis.

Turbidimetric and Electrochemical Detection of Endotoxin. Turbidimetric experiments were performed

following the protocol provided by the kinetic turbidimetric LAL reagent kit. Electrochemical detection of endotoxin was carried out according to our previous work.[1] Briefly, carbon screen-printed electrode was immersed in the mixture of 30 μL potassium ferricyanide solution (50 mM), 150 μL LAL reagent and 120 μL sample solution at 37 °C. Amperometric measurement was then performed at a constant voltage of –0.3 V on a CHI660D electrochemical analyzer (CH Instruments, Shanghai, China).

References

1. P. Miao, K. Han, J. Qi, C. Zhang and T. Liu, *Electrochem. Commun.*, 2013, **26**, 29-32.

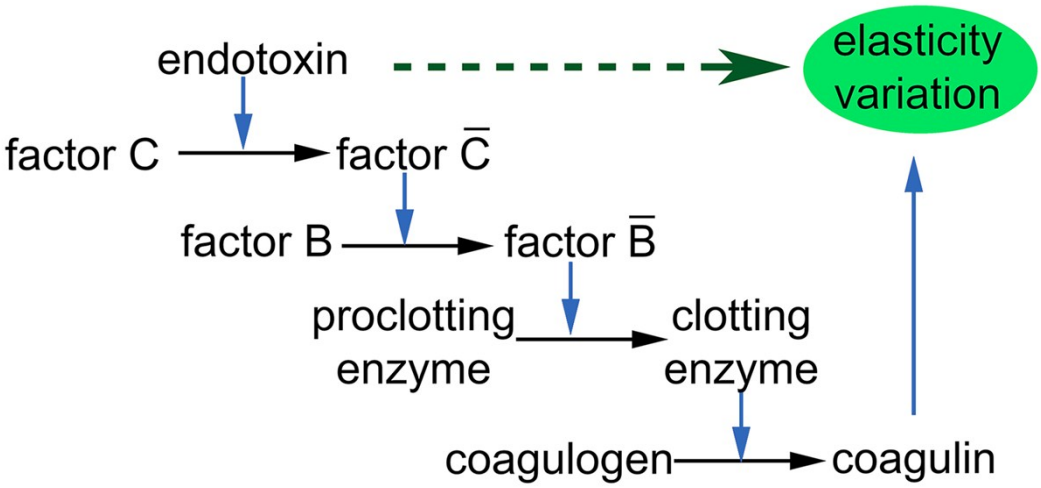

Fig. S1. Scheme of the endotoxin-induced elasticity variation of LAL.

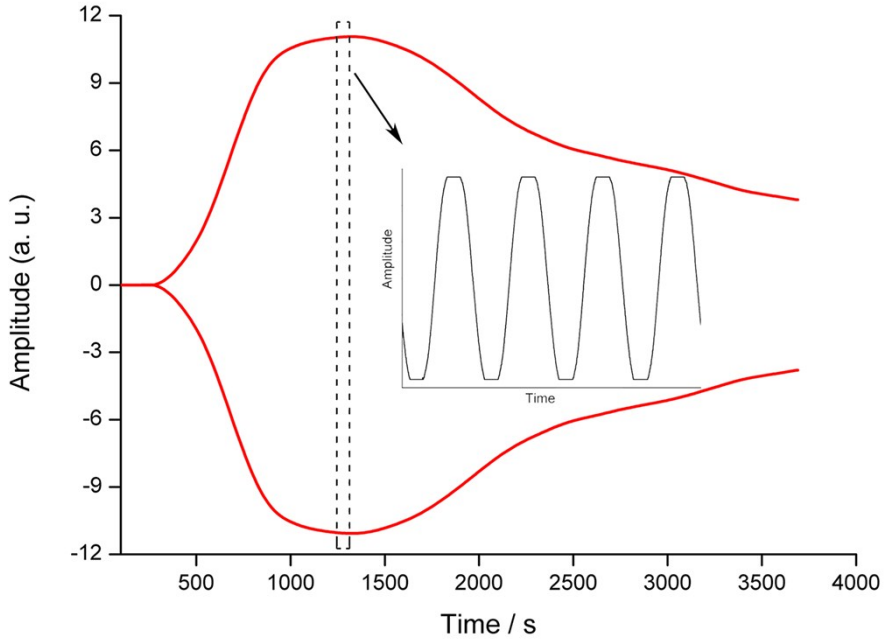

Fig. S2. Calibration curve of EG oscillation amplitude versus time. The concentration of endotoxin is 20 EU mL^{-1}.